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siderable force was required to separate them. The snake was about twenty inches long, the turtle eight inches. The foot was bleached, and blood was still flowing; none had apparently escaped from the mouth of the snake. Two toes were missing, having been digested from the foot. The entire foot appeared as though it had been subjected to a continued maceration within the mouth of the snake.

Twice afterward I noticed this strange habit of the puff adders. The late Professor Mudge mentioned to me that he had observed this habit in these snakes. I have not been able to find any signs indicating that the snake ever attaches itself to a fore foot. It seems as though they choose a foot that the turtle is unable to defend. The neck can not reach the hind foot as it can the front, and free it of any object that may attempt to lay hold upon it. The carapace may protect the tail.

I took pains to examine many box turtles (*Cistudo ornata*) that occur along the Smoky Hill rivers, and many, one can safely say one-half, are deformed in their hind feet. Very little deformity is found in the front feet. It must not be taken that all, or even a majority of these deformities are caused by adders. It is not on account of want of food, for there is never a lack of the insects here upon which the snakes generally subsist. It is not thirst, as the habit is practiced where there is water. The appearance of the foot, and the inability of the snake to masticate, would preclude any solution other than the desire to obtain blood as it flows from the lacerated parts.

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THE LIMIT OF THE INNUIT TRIBES ON THE ALASKA COAST.

BY IVAN PETROFF.

CIRCUMSTANCES over which I had no control detained me for several months during last summer and autumn in the section of Alaska where the Innuït and Thlinket tribes meet and to a certain extent intermingle with each other. I refer to the Alaskan coast between Prince William sound and Mt. St. Elias.

During a former residence and subsequent continuous travels in Alaska, I have paid particular attention to the distribution of the Innuïts. It had always been a question of practical interest

to me, because progress through Innuït territory was always comparatively easy and uninterrupted except by natural obstacles, while every excursion into the country occupied by other tribes was attended with open or secret opposition on the part of the natives, and occasional threats of violence or even overt acts of hostility.

In the course of my explorations, extending over a period of several years, of all the coast from Bering strait to the vicinity of Mt. St. Elias and of the river systems, I had found the Innuïts occupying the coast and interior wherever nature has thrown no obstacle in the way of free navigation in their kaiaks or skin-covered canoes; and consequently this eastern limit or boundary of the long chain of homogeneous orarian tribes was a locality of peculiar interest to me. The tribes who now have their homes in this vicinity are the so-called Chugach, of purely Innuït extraction; the Oughalentze, or Oughalakmute of Innuït extraction, but now mixed with Thlinkets; and thirdly, the so-called Chilkhaat tribe of the Thlinket family, settled on Comptroller's bay and up to the left bank of Copper river. The Chugach, whose name is a Russian corruption of their own tribal name of Sh-Ghachit Shoit (the latter word means simply "people"), partake of all the characteristics ascribed to the Innuïts of the Alaskan coast south of Bering strait. They hunt marine mammals in preference to land animals, and their whole domestic economy and mode of life rests upon the use of the kaiak or bidarka. The Oughalakmutes have always been the easternmost branch of Innuït stock along the coast. The earliest Spanish and English visitors to Prince William sound described more than a hundred years ago, the natives of that region just as we find them now, and I have been unable to discover any proofs of the existence of these tribes farther down the coast. It is true that in one instance Lieutenant Ring, of the U. S. Army, reported the discovery of relics apparently of Innuït type, in shell heaps near the mouth of the Stakhine river, and a few skulls, said to be of the same type, have been found in Santa Barbara county, California. Both of these can be easily accounted for by the compulsory wanderings of Aleuts and other Innuïts under the Russian rule at the end of the last and the beginning of the present century. Thousands of Innuït hunters who accompanied their iron-willed masters down the northwest coast of the American continent were slain and

captured by the more warlike Thlinkets, and a few skulls in Santa Barbara county may be all that is left of the prisoners taken on that very coast from sea-otter hunting expeditions undertaken by English and American skippers who were furnished with Innuvit hunters by the Russian authorities at Sitka.

I am aware that my classification of these tribes conflicts with that adopted by Mr. William H. Dall in his essay on the Distribution of the native tribes of Alaska, in Vol. I, Contributions to North American Ethnology. Mr. Dall's personal intercourse with these people must have been of brief duration, or he would not have confounded the Chilkhaaks and the Oughalentzes. The name of the latter in its proper form of Oughalakmute simply means "far away people;" Oughaluikhtuk in the Chugach dialect meaning "far distant." Mr. Dall also was mistaken in his assertion that the Copper river or Ah-Tena Indians had forced their way between the Thlinkets and the Innuits, and hold a small part of the coast.

These Indians do not hold now and never did hold, as far as it is possible to learn, any portion of the coast. A small number of them, consisting of traders only, visit the post of Nuchek or Port Etches every year, but to enable them to accomplish this voyage, they purchase large bidars or skin-covered boats of the Innuits. In their own country birch bark canoes form their only means of navigation.

We have every reason to believe that formerly the Innuits occupied the coast as far as the indentation commonly called Icy bay, but the constant pressure of the stronger Thlinket tribes has caused them to recede gradually to the localities occupied by them at the present day. In the vicinity of Icy bay the glaciers of the Mt. St. Elias range of Alps reach down to the coast, forming a long line of icy cliffs, a stretch of coast affording absolutely no landing place for boats or canoes. This feature has proved an insurmountable obstacle in the way of kaiak navigation, necessitating as it does a continuous sea voyage of between two and three days without making a landing. The Innuvit in his kaiak could not accomplish this, but the Thlinkets in their large wooden canoes, provided with masts and sails, could easily traverse this distance, with favorable winds, without being obliged to land.

When the Russians first came into this neighborhood, they found the two tribes struggling for supremacy; the Muscovite

invaders, consulting their own interests, gave their assistance to the weaker tribe, and during their occupation of the country put a stop to a further advance of the Thlinkets. Only fifteen years have elapsed since this restriction was removed and already we see the effect in the absorption of former Innuït territory by the Kolash.

Every fact I have been able to collect in connection with tribal movements over this debatable ground, points to a migration of the Innuïts along the Alaskan coast southward and eastward until they met the Thlinkets, and until stopped by the long stretch of inaccessible cliffs and icy promontories already mentioned. I am also inclined to believe that the whole movement originated from the American Arctic coast at a period subsequent to the invention of the kaiak. Within the last twenty years I have observed instances of individual migration at various points of the Alaskan coast, but always in the same direction. I have found individuals and families from the Lower Yukon in the vicinity of Bristol bay and in the interior of the Alaska peninsula. The Mahlemute or Koikhpagamute of to-day looks to the southward and eastward as the direction in which to find a better country, just as his ancestors did centuries ago.

Mr. Dall, in the paper above referred to, seems to adopt the theory of the gradual advance of the Innuïts from the interior of North America to the coast before the impulse of successive waves of other tribes behind them. This theory, first promulgated by Dr. Rink, is entirely tenable if we suppose that these waves of retreating Innuïts reached the coast first in high altitudes, in a region devoid of timber, such as would lead to a change from the habits of an inland people to those of the modern Innuït, and to the final invention of the kaiak. If, in accordance with this theory, the Innuïts were driven northward along the coast to their present homes before the onset of the Thlinket tribes, the natural conclusion would be that the rear guard of the vast Innuït army stopped about the region of the Copper river country, where we find them to-day. This region and the whole of Prince William sound, as well as the shores of the Kenai peninsula, are densely wooded, and the question arises, how came these people to adopt the use of the kaiak when they are surrounded with every facility for constructing canoes from the same material that they must have known and applied to the same pur-

pose in their southern or interior home? The natural barrier to kaiak navigation mentioned above, has been passed ages ago by the Thlinket tribes, but these never adopted the use of the kaiak; they still hunt and travel in their dugouts that they brought with them from their former homes in the south-east. The exclusive use of the kaiak or bidarka in this Alpine region, with dense forests and dangerous beaches, can only be explained by the emigration of the people from other regions devoid of timber. From whatever direction the Innuït people of Prince William sound and the Copper river delta came, they brought with them the kaiak or it never would have been invented there. The Oughalentze, who are now confined to two villages, Alaganuk and Ikhiak (called Odiak by the traders), have already ceased to construct bidarkas, owing to the preponderance of the Thlinket element among them. Their houses are constructed on the Thlinket plan and the younger generation speaks the Thlinket language only, while the older men and women speak both the latter and the Innuït. The Chilkaats, on the other hand, offer to the observer but few faint traces of their Innuït intermixture, and in their intercourse with Chugach Innuïts and the traders, they use interpreters. They wear blankets exclusively.

The end of the Innuït element is here very clearly defined. Here, as everywhere on the Alaskan coast, the traveler will at once observe the extreme caution with which the Innuït moves and acts as soon as he finds himself among people of another tribe. In their own country they always endeavor to pass the night at some village, but as soon as they enter foreign or even debatable territory, the camp is pitched far away from the habitation of man, even when they are escorting a white man. On this terminal line of Innuït population, the feeling amounts to abject fear. Money will not tempt the Chugatch to advance into the Thlinket country.

An argument in favor of my theory concerning the more recent period at which the Innuïts spread over the Alaska coast may perhaps be found in the existence of a branch of this tribe on the Aleutian islands. I fully agree with Mr. Dall that the theory of an Asiatic influx of population over the Aleutian chain of islands is entirely untenable, and that they were peopled from the east, but I do not think that this migration took place before the invention of the kaiak. Timber evidently never existed on these

islands; the only equivalent being the drift wood collected along the beaches and promontories, but this kind of material, water-logged and sodden, was entirely unfit for the manufacture of wooden canoes, or even for the construction of rafts, by which means Mr. Dall supposes the early Aleuts advanced from island to island. The frequency of gales, the violence of currents and the width of channels between these islands would also prevent the use of rafts as means of transportation and traffic. The assumption that the earliest inhabitants of the Aleutian islands were without a *kaiak* or boat of some kind, is based upon researches in the shell heaps of abandoned village sites on those islands; but a *kaiak* with a whalebone or even a wooden frame without its modern ornaments of ivory and bone, contained no material that would withstand decay and final absorption. The skin covering when worn out and unfit for use as such, was, no doubt, then as now, cut up into straps and patches, or served as food in time of famine, while the frame could be utilized in many ways that would leave no trace behind. The mere absence from the lower strata of shell heaps of anything pointing to the existence of the *kaiak*, can scarcely be considered as proof conclusive of its non-existence. My personal observations have led me to believe that the remains of former villages and dwellings found on the Aleutian islands and on the continental coast of Alaska, are not of the antiquity ascribed to them. Wherever I had the opportunity to observe such localities at long intervals of time, I was astonished at the rapidity with which nature extinguished the traces of man by a growth of sphagnum and other vegetation, giving to the site of the village abandoned but a few years, every appearance of great antiquity.

The absence of stone and bone implements of more delicate construction from the lower strata of the shell heaps can easily be attributed to the same cause that explains the absence of iron implements from the upper layers that must have accumulated within historic times. Such articles were the product of much labor, and consequently too precious to be lost. At every successive removal from one dwelling place to another all such products of their ingenuity were carefully collected and removed by the ancient Aleuts, just as it is done now with regard to iron by the natives of the present day.

On these treeless isles the removal from one hunting or fish-

ing ground to another of a few families or a community, always involved the transportation of every log or plank and every particle of wood to be found about the place. As an instance of this kind, I may point to the removal of the people of Makushin, on Oonalashka island which took place in the early part of the year 1879. In the summer of 1880 I visited the spot from which the people had removed, and found the outlines of every house indicated by a slight depression in the ground and enclosed by low ridges of earth covered already with a dense growth of sphagnum and grasses. Every piece of wood about the whole settlement had disappeared simultaneously with the people, and I have no doubt that an explorer unacquainted with the circumstances could dig up these remains without finding a scrap of iron, or anything indicating their recent occupation by at least semi-civilized people. Another example of this kind, and even more forcible in total absorption of all signs of recent occupation, can be found on the island of Atkha at the site of the former settlement of Korovinsky, the people of which removed to Nazan on the other side of the island, less than fifteen years ago.

In the settlements remote from the trading centers the people of Innuït stock live to-day as they did probably centuries ago, in a manner not at all inconsistent with the remains found in the lower strata of shell heaps. Even the presence of stone and bone arrow and spear heads is no true indication of age, as they are manufactured at the present day, as I had an opportunity to witness frequently during my travels in remote regions.

The time required for the formation of a so-called layer of "kitchen refuse" found under the sites of Aleutian or Innuït dwellings, I am also inclined to think less than indicated by Mr. Dall's calculations. Anybody who has watched a healthy Innuït family in the process of making a meal on the luscious echinus or sea urchin, would naturally imagine that in the course of a month they might pile up a great quantity of spinous débris. Both hands are kept busy conveying the sea fruit to the capacious mouth; with a skillful combined action of teeth and tongue, the shell is cracked, the rich contents extracted, and the former falls rattling to the ground in a continuous shower of fragments until the meal is concluded. A family of three or four adults, and perhaps an equal number of children, will leave behind them a shell monument of their voracity a foot or eighteen inches in

height after a single meal. In localities in Prince William sound I had an opportunity to examine the camp sites of sea-otter hunters on the coast contiguous to their hunting grounds. Here they live almost exclusively upon echinus, clams and mussels, which are consumed raw in order to avoid building fires and making smoke, and thereby driving the sensitive sea otter from the vicinity. The heaps of refuse created under such circumstances during a single season were truly astonishing in size. They will surely mislead the ingenious calculator of the antiquities of shell heaps a thousand years hence.

On the coast of Cook's inlet I have observed other instances of the rapid transformation of dwelling sites.

In the year 1869 I erected a substantial log house in the vicinity of the village of Chkituk. I visited the spot last summer and discovered nothing but faint lines of the foundation of my house indicated by low ridges overgrown with mosses and grasses, and two young spruce trees growing up from the spot where my fireplace had been located. In the same locality, at the mouth of the Kaknu or Kenai river, the remains of the first log building erected there by the Russians in 1789, can now be seen protruding from the almost perpendicular river bank fifteen or twenty feet under the present surface.

As an instance of the rapidity with which the tides of this region will change outlines of coast and other land marks, I may cite an observation made by me during my stay on Nuchek island last summer. At a short distance from the settlement there was a cave in a rocky cliff situated about three or four feet above high water mark. I visited the place frequently, as it afforded a view over the approaches to the harbor. About the middle of June an eclipse of the moon occurred when it was full or nearly so, causing tidal commotion of unusual extent and violence. When I visited my cave on the day following the eclipse, I found it almost filled with shingles and débris. This cave was situated at about the same height above the water as the cave of Amaknak, from which Mr. Dall extracted such voluminous information as to the antiquity of strata of refuse found therein. I cite these instances only for the purpose of showing that it is not safe to ascribe great age to any and all accumulations of débris found on the coast of Alaska, and also as a support for my theory of a general Innuvit

migration along the coast at a comparatively recent period, subsequent to the invention of the *kaiak* or a similar structure.

The lines of demarkation between the Innuïts and Thlinkets in the St. Elias Alpine region are very clearly drawn, and we can account for the presence of the former with the very customs and habits characterizing their kindred in the north and west among entirely different surroundings only by a migration southward after these habits were formed, and thus far I have been able to obtain no authentic information of any real traces of Innuït occupation beyond the point indicated.

The existence of man on the Aleutian islands and the coast of Alaska prior to the arrival of the tribes, we know is at best problematical. Traditions pointing in that direction are by no means wanting among the Aleuts, but our only authority for their existence is Veniaminof. The fable of supernatural beings dwelling in the interior mountain fastnesses of the islands related by Mr. Dail is based upon a failure to recognize a common Russian word. The "*Vaygali*" or "*Vaygli*" referred to by that gentleman were fugitives or outcasts who fled from the villages on account of crimes committed, and led a brief and wretched existence among the barren hills. The Russian word "*Vaglai*" means simply "fugitives."

From a Shaman of the Chilkhaak tribe, who boasted of his pure Thlinket extraction, I learned that a tradition exists among his people that in times past their ancestors held all the territory to the westward clear to the shores of "another big sea," but that the Innuïts came from the north, as he expressed it, like "herrings"—each in his own *kaiak*. The sea was covered with men, while women and children trudged along the shore. There was much fighting and a final retreat of the Thlinkets, but they would one day recover their own.

One unsupported tradition of this kind, of course amounts to nothing. I give it here only for what it is worth. One thing, however, has become clear to my mind during last summer. Unless unforeseen events interfere, the southern limit of Innuït tribes on the Alaskan coast will not be the same as it is now a century hence. Wherever a mixture with the Kolash has taken place, the latter rapidly gain the upper hand, and in a comparatively brief time the Innuït element is completely absorbed.